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# Surface Mount Type

## Series : VS

**Jameco Part Number 193105**

■ Features

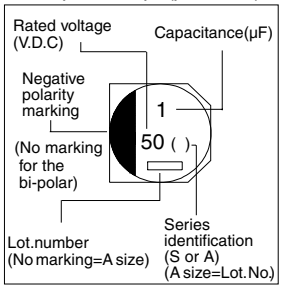
- General purpose
- Life time: 85°C 2000 h
- 5.5 mm height (≦φ6.3)

■ Specifications

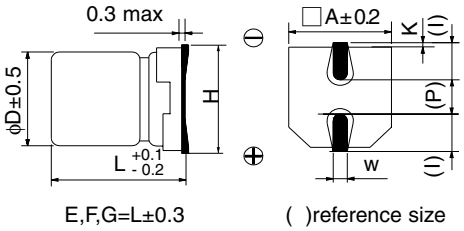
| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Operating Temp. Range | -40 to +85°C | | | | | | | | | | |
| Rated W.V. Range | 4 to 100 V .DC | | | | | | | | | | |
| Nominal Cap. Range | 0.1 to 1500μF | | | | | | | | | | |
| Capacitance Tolerance | ± 20 % (120Hz/+20°C) | | | | | | | | | | |
| D.C. Leakage Current | I ≦ 0.01 CV or 3 (μA) after 2 minutes . (Bi-polar: I≦0.02 CV or 6 (μA) ) (Whichever is greater) | | | | | | | | | | |
| Dissipation Factor (tan δ) | Refer to standard products table. | | | | | | | | | | |
| Characteristics at Low Temperature | W.V. (V) | 4 | 6.3 | 10 | 16 | 25 | 35 | 50 | 63 | 100 | (Impedance ratio max at 120 Hz) |
| | -25 / +20 °C | 7 | 4 | 3 | 2 | 2 | 2 | 2 | 3 | 3 | |
| | -40 / +20 °C | 15 | 8 | 6 | 4 | 4 | 3 | 3 | 4 | 4 | |
| Endurance | After applying rated working voltage for 2000 hours at +85°C and then being stabilized at +20°C, capacitors shall meet the following limits. | | | | | | | | | | |
| | Capacitance change | ±20% of initial measured value (±30% for φ3, 4 W.V., and miniaturized [suffix WR/WP] parts) | | | | | | | | | |
| | D.F. | ≦ 200% of initial specified value | | | | | | | | | |
| | D.C.leakage current | ≦ initial specified value | | | | | | | | | |
| Shelf Life | After storage for 1000 hours at +85ºC with no voltage applied and then being stabilized at +20°C, capacitor shall meet the limits specified in "Endurance." (With voltage treatment) | | | | | | | | | | |
| Resistance to Soldering Heat | After reflow soldering (refer to Application Guidelines) and then being stabilized at +20°C, capacitor shall meet the following limits. | | | | | | | | | | |
| | Capacitance change | ±10% of initial measured value | | | | | | | | | |
| | D.F. | ≦ initial specified value | | | | | | | | | |
| | D.C leakage current | ≦ initial specified value | | | | | | | | | |

■ Marking

Example;50V1μF(polarized)




■ Dimensions in mm (not to scale)




(mm)

| Size code | φD | L | A | H | I | W | P | K |
|---|---|---|---|---|---|---|---|---|
| A | 3.0 | 5.4 | 3.3 | 4.5MAX | 1.5 | 0.55±0.1 | 0.6 | 0.35 +0.15 -0.20 |
| B | 4.0 | 5.4 | 4.3 | 5.5MAX | 1.8 | 0.65±0.1 | 1.0 | 0.35 +0.15 -0.20 |
| C | 5.0 | 5.4 | 5.3 | 6.5MAX | 2.2 | 0.65±0.1 | 1.5 | 0.35 +0.15 -0.20 |
| D | 6.3 | 5.4 | 6.6 | 7.8MAX | 2.6 | 0.65±0.1 | 1.8 | 0.35 +0.15 -0.20 |
| D8 | 6.3 | 7.9 | 6.6 | 7.8MAX | 2.6 | 0.65±0.1 | 1.8 | 0.35 +0.15 -0.20 |
| E | 8.0 | 6.2 | 8.3 | 9.5MAX | 3.4 | 0.65±0.1 | 2.2 | 0.35 +0.15 -0.20 |
| F | 8.0 | 10.2 | 8.3 | 10.0MAX | 3.4 | 0.90±0.2 | 3.1 | 0.70 ±0.2 |
| G | 10.0 | 10.2 | 10.3 | 12.0MAX | 3.5 | 0.90±0.2 | 4.6 | 0.70 ±0.2 |

■ Standard Products

● Polarized

| w.v. / Cap.(μF) | 4 (0G) | 6.3 (0J) | 10 (1A) | 16 (1C) | 25 (1E) | 35 (1V) | 50 (1H) | 63 (1J) | 100 (2A) |
|---|---|---|---|---|---|---|---|---|---|
| 0.1 | | | | | | | A,B | | |
| 0.22 | | | | | | | A,B | | |
| 0.33 | | | | | | | A,B | | |
| 0.47 | | | | | | | A,B | | |
| 1.0 | | | | | | | A,B | | |
| 2.2 | | | | | | A | A,B | | |
| 3.3 | | | | | | A | B | | E |
| 4.7 | | | | | A,B | B | B,C | | E,F |
| 10 | | | | A,B | B,C | B,C | C,D | D | E,F |
| 22 | A | A,B | B | B,C | C,D | C,D | D,E | E,F | F,G |
| 33 | B | B | B,C | C | C,D | D,E | D8,E,F | F | G |
| 47 | B | B,C | C | C,D | D | D,E | D8,F,G | F | |
| 100 | C | C,D | C,D | D,E | D8,E,F | D8,F,G | F,G | G | |
| 220 | D | D | D8,E | D8,E,F | F,G | F,G | G | | |
| 330 | | D8,E | F | F,G | F,G | G | | | |
| 470 | | F | F,G | F,G | G | | | | |
| 1000 | | F,G | G | | | | | | |
| 1500 | | G | | | | | | | |

● Bi-polar

| W.V. / Cap.(μF) | 6.3 (0J) | 10 (1A) | 16 (1C) | 25 (1E) | 35 (1V) | 50 (1H) |
|---|---|---|---|---|---|---|
| 0.22 | | | | | | B |
| 0.33 | | | | | | B |
| 0.47 | | | | | | B |
| 1.0 | | | | | | B |
| 2.2 | | | | | B | C |
| 3.3 | | | | B | | C |
| 4.7 | | | B | C | C | D |
| 10 | | B | C | D | D | |
| 22 | C | | D | | | |
| 33 | | D | | | | |
| 47 | D | | | | | |

## ■ Standard Products

| W.V [V.DC] | Cap. [μF] | Part No. | tan δ | R.C. [mA rms] | Size [mm] D | L |
|---|---|---|---|---|---|---|
| 4 | 22 | ECEV0GS220SR | 0.37 | 19 | 3 | 5.4 |
| | 33 | ECEV0GA330SR | 0.35 | 26 | 4 | 5.4 |
| | 47 | ECEV0GA470SR | 0.35 | 34 | 4 | 5.4 |
| | 100 | ECEV0GA101SR | 0.35 | 61 | 5 | 5.4 |
| | 220 | ECEV0GA221SP | 0.35 | 82 | 6.3 | 5.4 |
| 6.3 | 22 | ECEV0JS220WR | 0.35 | 20 | 3 | 5.4 |
| | | ECEV0JA220SR | 0.26 | 29 | 4 | 5.4 |
| | 33 | ECEV0JA330WR | 0.35 | 29 | 4 | 5.4 |
| | 47 | ECEV0JA470WR | 0.35 | 36 | 4 | 5.4 |
| | | ECEV0JA470SR | 0.26 | 46 | 5 | 5.4 |
| | 100 | ECEV0JA101WR | 0.35 | 47 | 5 | 5.4 |
| | | ECEV0JA101SP | 0.26 | 71 | 6.3 | 5.4 |
| | 220 | ECEV0JA221WP | 0.35 | 74 | 6.3 | 5.4 |
| | 330 | ECEV0JA331XP | 0.26 | 150 | 6.3 | 7.9 |
| | | ECEV0JA331P | 0.35 | 300 | 8 | 6.2 |
| | 470 | ECEV0JA471P | 0.35 | 380 | 8 | 10.2 |
| | 1000 | ECEV0JA102UP | 0.35 | 500 | 8 | 10.2 |
| | | ECEV0JA102P | 0.35 | 700 | 10 | 10.2 |
| | 1500 | ECEV0JA152P | 0.35 | 700 | 10 | 10.2 |
| 10 | 22 | ECEV1AA220WR | 0.30 | 28 | 4 | 5.4 |
| | 33 | ECEV1AA330WR | 0.30 | 29 | 4 | 5.4 |
| | | ECEV1AA330SR | 0.20 | 43 | 5 | 5.4 |
| | 47 | ECEV1AA470WR | 0.30 | 43 | 5 | 5.4 |
| | 100 | ECEV1AA101WR | 0.30 | 50 | 5 | 5.4 |
| | | ECEV1AA101SP | 0.20 | 70 | 6.3 | 5.4 |
| | 220 | ECEV1AA221XP | 0.20 | 150 | 6.3 | 7.9 |
| | | ECEV1AA221P | 0.26 | 250 | 8 | 6.2 |
| | 330 | ECEV1AA331P | 0.26 | 330 | 8 | 10.2 |
| | 470 | ECEV1AA471UP | 0.26 | 330 | 8 | 10.2 |
| | | ECEV1AA471P | 0.26 | 400 | 10 | 10.2 |
| | 1000 | ECEV1AA102P | 0.26 | 580 | 10 | 10.2 |
| 16 | 10 | ECEV1CS100SR | 0.18 | 20 | 3 | 5.4 |
| | | ECEV1CA100SR | 0.16 | 28 | 4 | 5.4 |
| | 22 | ECEV1CA220WR | 0.26 | 28 | 4 | 5.4 |
| | | ECEV1CA220SR | 0.16 | 39 | 5 | 5.4 |
| | 33 | ECEV1CA330WR | 0.26 | 35 | 5 | 5.4 |
| | 47 | ECEV1CA470WR | 0.26 | 39 | 5 | 5.4 |
| | | ECEV1CA470SP | 0.16 | 70 | 6.3 | 5.4 |
| | 100 | ECEV1CA101WP | 0.26 | 70 | 6.3 | 5.4 |
| | | ECEV1CA101P | 0.20 | 200 | 8 | 6.2 |
| | 220 | ECEV1CA221XP | 0.16 | 150 | 6.3 | 7.9 |
| | | ECEV1CA221UP | 0.20 | 200 | 8 | 6.2 |
| | | ECEV1CA221P | 0.20 | 280 | 8 | 10.2 |
| | 330 | ECEV1CA331UP | 0.20 | 320 | 8 | 10.2 |
| | | ECEV1CA331P | 0.20 | 380 | 10 | 10.2 |
| | 470 | ECEV1CA471UP | 0.20 | 320 | 8 | 10.2 |
| | | ECEV1CA471P | 0.20 | 420 | 10 | 10.2 |
| 25 | 4.7 | ECEV1ES4R7SR | 0.16 | 12 | 3 | 5.4 |
| | | ECEV1EA4R7SR | 0.14 | 22 | 4 | 5.4 |
| | 10 | ECEV1EA100WR | 0.20 | 22 | 4 | 5.4 |
| | | ECEV1EA100SR | 0.14 | 28 | 5 | 5.4 |
| | 22 | ECEV1EA220WR | 0.20 | 35 | 5 | 5.4 |
| | | ECEV1EA220SP | 0.14 | 55 | 6.3 | 5.4 |
| | 33 | ECEV1EA330WR | 0.20 | 42 | 5 | 5.4 |
| | | ECEV1EA330SP | 0.14 | 65 | 6.3 | 5.4 |
| | 47 | ECEV1EA470WP | 0.20 | 70 | 6.3 | 5.4 |
| | | ECEV1EA470UP | 0.16 | 70 | 6.3 | 5.7* |
| | 100 | ECEV1EA101XP | 0.14 | 150 | 6.3 | 7.9 |
| | | ECEV1EA101UP | 0.16 | 91 | 8 | 6.2 |
| | | ECEV1EA101P | 0.16 | 180 | 8 | 10.2 |
| | 220 | ECEV1EA221UP | 0.16 | 140 | 8 | 10.2 |
| | | ECEV1EA221P | 0.16 | 310 | 10 | 10.2 |
| | 330 | ECEV1EA331UP | 0.16 | 150 | 8 | 10.2 |
| | | ECEV1EA331P | 0.16 | 340 | 10 | 10.2 |
| | 470 | ECEV1EA471P | 0.16 | 360 | 10 | 10.2 |

| W.V [V.DC] | Cap. [μF] | Part No. | tan δ | R.C. [mA rms] | Size [mm] D | L |
|---|---|---|---|---|---|---|
| 35 | 2.2 | ECEV1VS2R2SR | 0.14 | 8 | 3 | 5.4 |
| | 3.3 | ECEV1VS3R3SR | 0.14 | 10 | 3 | 5.4 |
| | 4.7 | ECEV1VA4R7SR | 0.12 | 22 | 4 | 5.4 |
| | 10 | ECEV1VA100WR | 0.16 | 22 | 4 | 5.4 |
| | | ECEV1VA100SR | 0.12 | 30 | 5 | 5.4 |
| | 22 | ECEV1VA220WR | 0.16 | 36 | 5 | 5.4 |
| | | ECEV1VA220SP | 0.12 | 60 | 6.3 | 5.4 |
| | 33 | ECEV1VA330WP | 0.16 | 60 | 6.3 | 5.4 |
| | | ECEV1VA330UP | 0.14 | 65 | 6.3 | 5.7* |
| | | ECEV1VA330P | 0.14 | 130 | 8 | 6.2 |
| | 47 | ECEV1VA470WP | 0.16 | 70 | 6.3 | 5.4 |
| | | ECEV1VA470P | 0.14 | 165 | 8 | 6.2 |
| | 100 | ECEV1VA101XP | 0.12 | 130 | 6.3 | 7.9 |
| | | ECEV1VA101UP | 0.14 | 140 | 8 | 10.2 |
| | | ECEV1VA101P | 0.14 | 210 | 10 | 10.2 |
| | 220 | ECEV1VA221UP | 0.14 | 200 | 8 | 10.2 |
| | | ECEV1VA221P | 0.14 | 310 | 10 | 10.2 |
| | 330 | ECEV1VA331P | 0.14 | 320 | 10 | 10.2 |
| 50 | 0.1 | ECEV1HS0R1SR | 0.14 | 1 | 3 | 5.4 |
| | | ECEV1HA0R1SR | 0.12 | 1 | 4 | 5.4 |
| | 0.22 | ECEV1HSR22SR | 0.14 | 2 | 3 | 5.4 |
| | | ECEV1HAR22SR | 0.12 | 2 | 4 | 5.4 |
| | 0.33 | ECEV1HSR33SR | 0.14 | 3 | 3 | 5.4 |
| | | ECEV1HAR33SR | 0.12 | 3 | 4 | 5.4 |
| | 0.47 | ECEV1HSR47SR | 0.14 | 5 | 3 | 5.4 |
| | | ECEV1HAR47SR | 0.12 | 5 | 4 | 5.4 |
| | 1 | ECEV1HS010SR | 0.14 | 8 | 3 | 5.4 |
| | | ECEV1HA010SR | 0.12 | 10 | 4 | 5.4 |
| | 2.2 | ECEV1HS2R2SR | 0.14 | 10 | 3 | 5.4 |
| | | ECEV1HA2R2SR | 0.12 | 16 | 4 | 5.4 |
| | 3.3 | ECEV1HA3R3SR | 0.12 | 16 | 4 | 5.4 |
| | 4.7 | ECEV1HA4R7WR | 0.14 | 18 | 4 | 5.4 |
| | | ECEV1HA4R7SR | 0.12 | 23 | 5 | 5.4 |
| | 10 | ECEV1HA100WR | 0.14 | 27 | 5 | 5.4 |
| | | ECEV1HA100SP | 0.12 | 35 | 6.3 | 5.4 |
| | 22 | ECEV1HA220WP | 0.14 | 60 | 6.3 | 5.4 |
| | | ECEV1HA220UP | 0.12 | 60 | 6.3 | 5.7* |
| | | ECEV1HA220P | 0.12 | 120 | 8 | 6.2 |
| | 33 | ECEV1HA330XP | 0.12 | 85 | 6.3 | 7.9 |
| | | ECEV1HA330UP | 0.12 | 130 | 8 | 6.2 |
| | | ECEV1HA330P | 0.12 | 140 | 8 | 10.2 |
| | 47 | ECEV1HA470XP | 0.12 | 90 | 6.3 | 7.9 |
| | | ECEV1HA470UP | 0.12 | 150 | 8 | 10.2 |
| | | ECEV1HA470P | 0.12 | 160 | 10 | 10.2 |
| | 100 | ECEV1HA101UP | 0.12 | 200 | 8 | 10.2 |
| | | ECEV1HA101P | 0.12 | 250 | 10 | 10.2 |
| | 220 | ECEV1HA221P | 0.12 | 300 | 10 | 10.2 |
| 63 | 10 | ECEV1JA100P | 0.18 | 35 | 6.3 | 5.7* |
| | 22 | ECEV1JA220UP | 0.18 | 40 | 8 | 6.2 |
| | | ECEV1JA220P | 0.18 | 40 | 8 | 10.2 |
| | 33 | ECEV1JA330P | 0.18 | 45 | 8 | 10.2 |
| | 47 | ECEV1JA470UP | 0.18 | 45 | 8 | 10.2 |
| | 100 | ECEV1JA101P | 0.18 | 60 | 10 | 10.2 |
| 100 | 3.3 | ECEV2AA3R3P | 0.18 | 50 | 8 | 6.2 |
| | 4.7 | ECEV2AA4R7UP | 0.18 | 50 | 8 | 6.2 |
| | | ECEV2AA4R7P | 0.18 | 80 | 8 | 10.2 |
| | 10 | ECEV2AA100UP | 0.18 | 50 | 8 | 6.2 |
| | | ECEV2AA100P | 0.18 | 85 | 8 | 10.2 |
| | 22 | ECEV2AA220UP | 0.18 | 70 | 8 | 10.2 |
| | | ECEV2AA220P | 0.18 | 90 | 10 | 10.2 |
| | 33 | ECEV2AA330P | 0.18 | 90 | 10 | 10.2 |

tan δ = at 120Hz/+20°C, Ripple current = at 120Hz/+85°C

* Shows φ6.3x6.0 mm max. special size



Design and specifications are subject to change without notice. Ask factory for technical specifications before purchase and/or use.
Whenever a doubt about safety arises from this product, please contact us immediately for technical consultation.

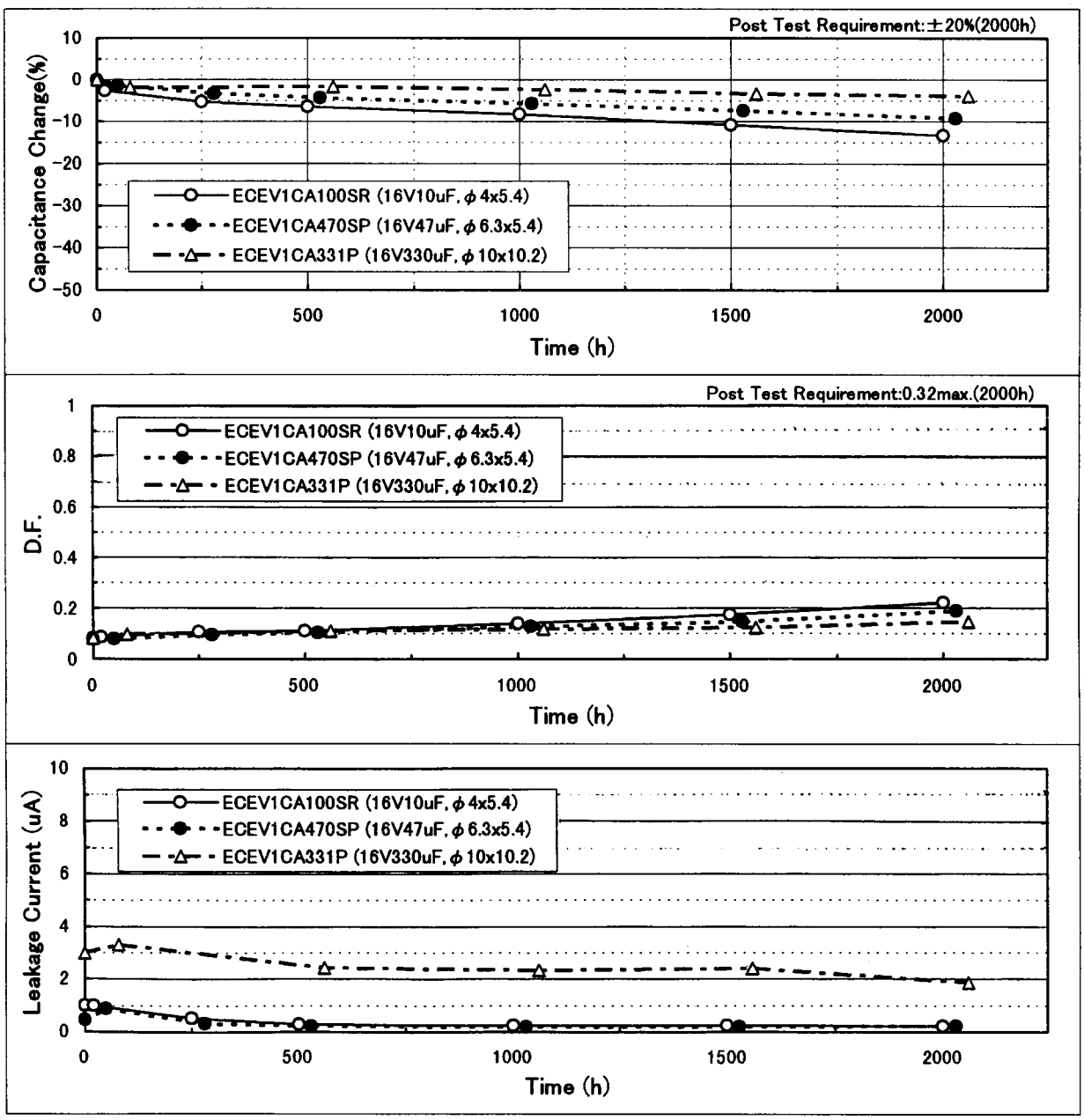
## ■ Standard Products (Bi-polar)

| W.V [V.DC] | Cap. [μF] | Part No. | tan δ | R.C. [mA rms] | Size [mm] D | L |
|---|---|---|---|---|---|---|
| 6.3 | 22 | ECEV0JA220NR | 0.52 | 29 | 5 | 5.4 |
| | 47 | ECEV0JA470NP | 0.52 | 46 | 6.3 | 5.4 |
| 10 | 10 | ECEV1AA100NR | 0.40 | 25 | 4 | 5.4 |
| | 33 | ECEV1AA330NP | 0.40 | 43 | 6.3 | 5.4 |
| 16 | 4.7 | ECEV1CA4R7NR | 0.32 | 20 | 4 | 5.4 |
| | 10 | ECEV1CA100NR | 0.32 | 25 | 5 | 5.4 |
| | 22 | ECEV1CA220NP | 0.32 | 39 | 6.3 | 5.4 |
| 25 | 3.3 | ECEV1EA3R3NR | 0.28 | 12 | 4 | 5.4 |
| | 4.7 | ECEV1EA4R7NR | 0.28 | 21 | 5 | 5.4 |
| | 10 | ECEV1EA100NP | 0.28 | 28 | 6.3 | 5.4 |

| W.V [V.DC] | Cap. [μF] | Part No. | tan δ | R.C. [mA rms] | Size [mm] D | L |
|---|---|---|---|---|---|---|
| 35 | 2.2 | ECEV1VA2R2NR | 0.24 | 12 | 4 | 5.4 |
| | 4.7 | ECEV1VA4R7NR | 0.24 | 22 | 5 | 5.4 |
| | 10 | ECEV1VA100NP | 0.24 | 30 | 6.3 | 5.4 |
| 50 | 0.22 | ECEV1HAR22NR | 0.24 | 2 | 4 | 5.4 |
| | 0.33 | ECEV1HAR33NR | 0.24 | 3 | 4 | 5.4 |
| | 0.47 | ECEV1HAR47NR | 0.24 | 5 | 4 | 5.4 |
| | 1 | ECEV1HA010NR | 0.24 | 10 | 4 | 5.4 |
| | 2.2 | ECEV1HA2R2NR | 0.24 | 16 | 5 | 5.4 |
| | 3.3 | EEVNZ1H3R3R | 0.24 | 21 | 5 | 5.4 |
| | 4.7 | ECEV1HA4R7NP | 0.24 | 31 | 6.3 | 5.4 |

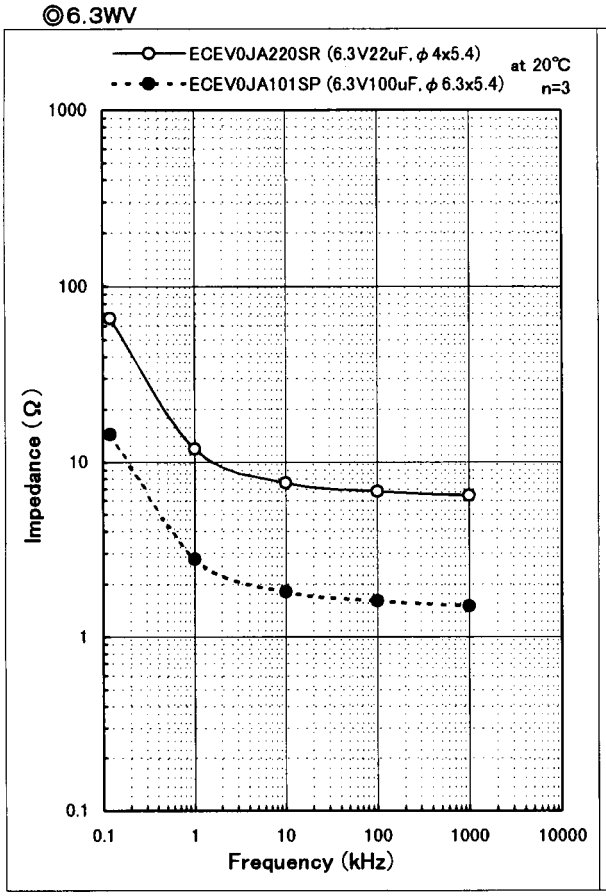
tan δ = at 120Hz/+20°C, Ripple current = at 120Hz/+85°C

## ■ Load Life Data

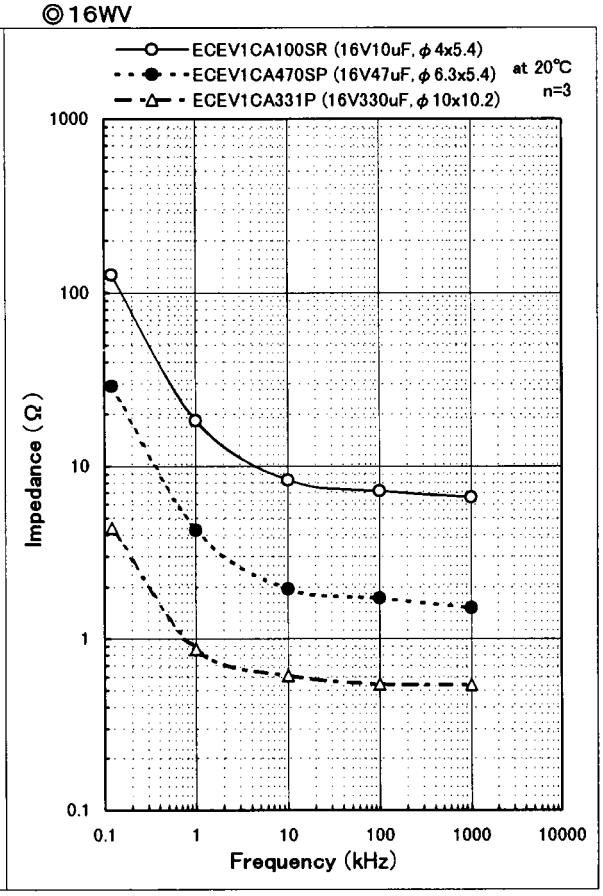


## ■ Frequency Characteristics Data

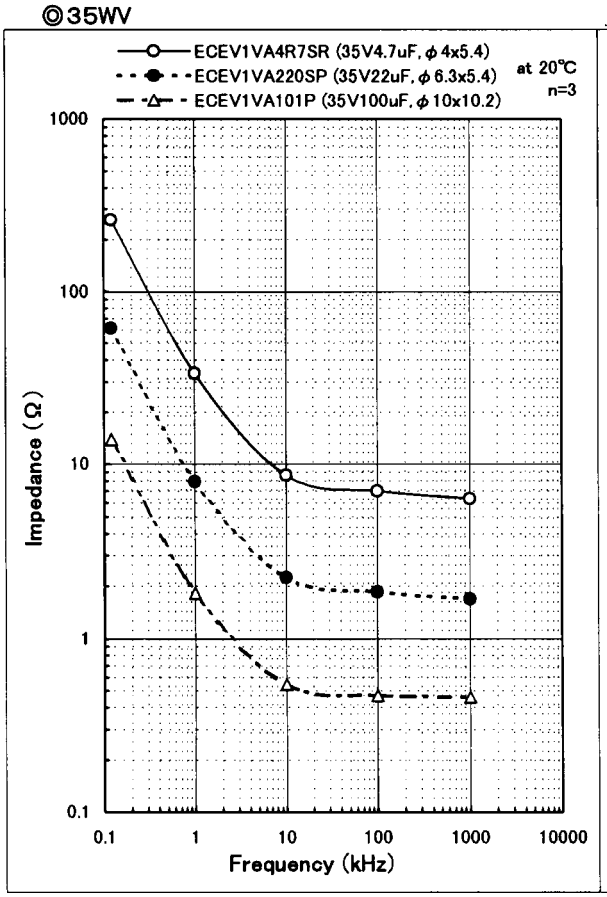
◎6.3WV



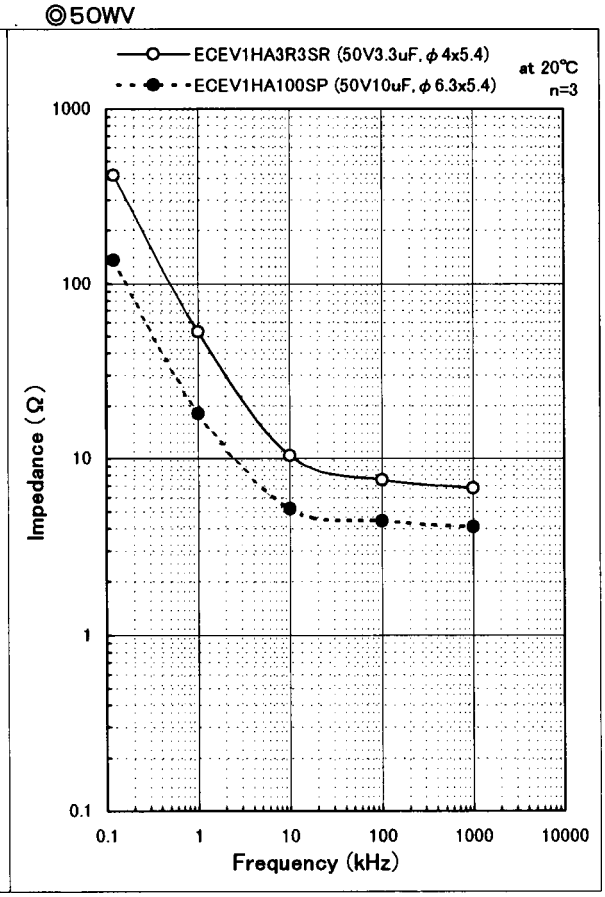

◎16WV




◎35WV




◎50WV





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■ Temperature Characteristics Data